Short communication

A study of scrub typhus in a medical college hospital in West Bengal, India

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(Received: July 2022 Revised: September 2022 Accepted: October 2022)

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ABSTRACT

Introduction and Aim: Scrub typhus is one of the leading causes of acute unexplained fever in children. The objective of this study was to determine the serological evidence of scrub typhus and associated clinical features in febrile children.

Materials and Methods: This retrospective observational study was performed for a duration of 21 months. Children aged below 12 years, admitted with unexplained fever and other clinical features suggestive of scrub typhus and tested for IgM against scrub typhus were included in our study. A detailed history, clinical profile and sero-prevalence of the children were analysed from record files.

Results: Four hundred and seventy one clinically suspected patients of below 12 years were tested for scrub typhus. Out of 471, 172 children were scrub typhus positive. Maximum number of positive cases were detected between the month of August and November. Fever was present in all patients. Nausea and vomiting, abdominal pain, cough, hepatomegaly, splenomegaly, lymphadenopathy, rash, convulsion and jaundice were other presenting clinical features. Eschar was observed only in 2.91% cases.

Conclusion: Scrub typhus is to be suspected in every children present with unexplained fever. Early diagnosis and early initiation of specific therapy is crucial for favourable outcome.

Keywords: Scrub typhus; *Orientia tsutsugamushi*; fever; eschar; children.

INTRODUCTION

Scrub typhus is caused by *Orientia tsutsugamushi*. It is transmitted by the larval forms of the trombiculid mites of the genus *Leptotrombidium*. In India scrub typhus is caused by *Leptotrombidium deliensis.* Human infection occurs when they are bitten by an infected mite larvae (chiggers). Scrub typhus is found in areas of heavy scrub vegetation and more commonly found in the rural population. Scrub typhus is distributed as an endemic disease in northern part of Australia, China, Korea, Japan, Indonesia, Pakistan, and India. Scrub typhus fever typically begins after an incubation period of 6-21days, accompanied with headache and myalgia. Other characteristics features are maculopapular rash, cough, gastrointestinal symptoms, lymphadenopathy, hepatomegaly and splenomegaly. Patients develop a characteristic focal lesion or eschar at the site of the mite bite. The clinical manifestations vary from mild and self-limiting disease to severe multiorgan failure and death.

In India scrub typhus is re-emerging and epidemic outbreaks were reported from different states of India. Scrub typhus is underdiagnosed in India due to its non-specific clinical presentation, limited awareness and low index of suspicion among clinicians. Clinical presentations, complications and treatment outcome of scrub typhus in children are largely variable. The goal of this study was to assess the serological evidence of scrub typhus and associated clinical features in febrile children.

MATERIALS AND METHODS

This retrospective observational study was carried out for duration of 21 months after taking approval of Institutional Ethics Committee (Memo No. IEC/MLD-MC/20-21/010 dated 07.01.2021).

Children below 12 years of age with history of fever for more than 5 days or other clinical features suggestive of scrub typhus and tested for IgM against scrub typhus were included in our study. The clinical and laboratory data were collected from record files of all the patients below 12 years, investigated for scrub typhus.

As per standard procedure, 5ml of blood was collected and was kept at room temperature and then centrifuged at 3000 rpm for 5 minutes and serum separated. Serum samples were tested for IgM antibodies against scrub typhus (*Orientia tsutsugamushi)* by ELISA following the manufacturer's instructions.

RESULTS

Out of 471 clinically suspected children, 172 children (36.52%) were positive for scrub typhus. Sero-positivity rate was higher in male. Out of 172 scrub typhus positive cases, 89 were men and 83 were women. 1.07:1 was the male to female ratio (89:83).

The children aged one month to 12 years were included in our study. Most of the patients aged between 1-3 years (68, 39.53%) and 4-6 years (61, 35.47%). The patients involved in this study from April 2019 to December 2020 are analysed by age and gender in Table 1.

Table 1: Age and sex wise distribution of children

Variables	Number of scrub typhus cases	Percentage
Sex		
Male	89	51.74%
Female	83	48.26%
Total	172 (n=172)	100%
Age (years)		
<1	12	6.98%
1-3	68	39.53%
4-6	61	35.47%
7-9	21	12.21%
10-12	10	05.81%
Total	172 (n=172)	100%

In our study, more than 90% cases (155, 90.12%) were from rural areas. We found various risk factors in positive cases like exposure to domestic animals, living close to crop fields or agricultural land, living in mud-floored houses, wood or cow dung being used as fuel and stored indoors, vegetation around houses, presence of cattle shed within or nearby their houses, defecating in open fields and practicing poor personal hygiene.

One hundred twenty six (73.26%, n=172) scrub typhus cases were observed in the months of August to November in two consecutive years (2019 and 2020) in the study period. In the year 2019, a significant quantity of scrub typhus cases had been also observed in the month of December and Fig. 1 displays graphical representation of month wise distribution of scrub typhus cases in different months of the year 2019 and 2020.

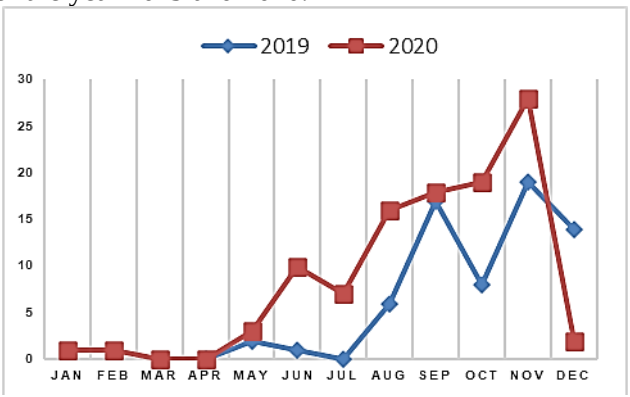

Fig.1: Graphical representation of number of scrub typhus cases in different months

Table 2: Clinical presentation of scrub typus in children

Clinical findings	Number (%)
Fever	172 (100)
Abdominal pain	74 (43.02)
Nausea/vomiting	98 (56.98)
Jaundice	24 (13.95)
Cough	77 (44.77)
Rash	29 (16.86)
Oedema	52 (30.23)
Headache	29 (16.86)
Convulsion	38 (22.09)
Eschar	05 (2.91)
Myalgia	31 (18.02)
Hepatomegaly	128 (74.42)
Splenomegaly	79 (45.93)
Lymphadenopathy	96 (55.81)

In our study, fever was the most common symptom. Other common presenting features were nausea and vomiting (56.98%), abdominal pain (43.02%), cough (44.77%), hepatomegaly (74.42%), splenomegaly (45.93%), lymphadenopathy (55.81%), rash (16.86%), convulsion (22.09%) and jaundice (13.95%). Eschar was observed only in five cases (2.91%) in our study. Table 2 shows the common presenting features of scrub typhus cases.

DISCUSSION

Out of 471 clinically suspected children, 172 children (36.52%) were positive for scrub typhus. Sero-positivity rate was slightly more in males (89, 51.74%) than the females (83, 48.26%). Most of the studies showed male preponderance. However, Zainab *et al.*, reported female predominance in their study (1).

Children below 1year were 6.98%, 1-3 years were 39.53%, 4-6 years were 35.47%, 7-9 years were 12.21% and 10-12 years were 5.81%. Most of the patients aged between 1-3 years (68, 39.53%) and 4-6 years (61, 35.47%). In some study, maximum number of cases were found around the age of five years (2, 3), in other studies, most cases were in the age range of 1 to 6 years (4). But in some studies children over 10 years were comprised for the majority of cases (5).

In our study, most of the patients (126, 73.26%) were infected just after the rainy season, between the months of August and November. Similar seasonal variation has been reported by other authors (6, 7, 8). The majority of the cases were reported by Zainab *et al.*, and Naveen *et al.*, between June and November (1, 9). In another study, maximum number of cases was observed between the month of May and August (10).

Scrub typhus patients presented with various spectrum of signs and symptoms. Fever was the most common

symptom in our study that was similar to other study findings (1, 11, 12).

Abdominal pain (43.02%), nausea-vomiting (56.98%) and cough (44.77%) were other common presenting symptoms. In a study in Dehradun, India, these symptoms were reported in 33%, 56%, 35% respectively (13). In a retrospective study in Nepal, abdominal pain was reported in 43% cases and vomiting in 42% cases (5).

Eschar is an important diagnostic clinical finding in scrub typhus patients. In our study eschar was found in only 2.91% cases. In a study conducted by Pathak *et al.*, eschar was found in 11.8% cases (14), Bal *et al.*, and Zainab *et al.*, reported eschar in17.9% and 20% cases respectively (15, 1). Eschar was not found even in a single patient in some previous observational study (13).

We found rash in 16.86% (29, n=172) children in our study. In a study conducted by Kishore *et al.*, rash was reported in 14.63% cases (4). In another study conducted by Zainab *et al.*, rash was found in 30% children (1). In other study by Digra *et al.*, rash was found in all children (100%, n=21) (16), whereas other authors reported neither eschar nor rash (17).

We observed hepatomegaly in 74.42% cases and splenomegaly in 45.93% cases. In one study, the author has reported hepatomegaly in 58.53% and splenomegaly in 53.66% cases (4). In other study by Krishnan *et al.*, hepatomegaly and splenomegaly were reported in 61% and 54% cases (2).

We observed lymphadenopathy in 55.81% cases in our study. In one study, author has reported lymphadenopathy in only 24% cases (5), whereas in similar other studies, lymphadenopathy was observed in 37%, 70% and 74% of scrub typhus patients (11, 1, 15), while Rakholia *et al.*, has not reported any case of lymphadenopathy (18).

CONCLUSION

Scrub typhus is re-emerging disease in India. It is associated with grave complications and accounts for a large number of deaths. High sero-positivity rate of scrub typhus was found in our study. So scrub typhus is to be suspected in every children present with unexplained fever to reduce long term complications and mortality due to scrub typhus.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

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